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AUTHOR Zammuto, Raymond F.
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ABSTRACT

The roles of organizational slack, flexibility, and variety are considered with respect to the incidence of growth, stability, and decline in college and university enrollments and revenues from 1975 to 1979. Slack refers to the resources possessed by an organization beyond those needed for the most efficient possible level of operation. Flexibility focuses on the ability of an organization to redirect the use of resources in the short-run, and variety refers to the degree of institutional diversity in programs and revenue sources. Using data from the Higher Education General Information Survey (HEGIS) for 2,713 schools, the schools were classified according to whether their enrollments and revenues had grown, remained stable, or declined from 1975 to 1979. Differences among these groups on nine variables representing levels of slack, flexibility, and variety in 1975-1976 were examined using multivariate analysis of variance. Public and private institutions were examined separately. Stable institutions exhibited higher levels of variety in programs and revenue sources than did growing or declining institutions. Institutions with declining enrollments had lower levels of slack resources than did growing or stable institutions, while institutions with declining revenues had higher education of slack resources than did growing or stable institutions. For private schools the level of slack resources decreased as the severity of enrollment and revenue decline encountered in later years increased. Similarly, the level of programmatic and revenue source variety decreased as the severity of enrollment and revenue decline encountered increased. The results are examined within the context of the population ecology and innovation literature from the organization sciences. (Author/SW)

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Organizational Correlates of Decline: Some Preliminary Analyses

Raymond F. Zammuto
National Center for Higher Education Management Systems
P.O. Drawer P
Boulder, CO 80302
(303) 497-0372

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Association for the Study of Higher Education

The George Washington University / One Dupont Circle, Suite 630 / Washington, D.C. 20036
(202) 296-2597

This paper was presented at the Annual Meeting of the Association for the Study of Higher Education held at the Washington Hilton in Washington, D.C. March 2-3, 1982. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

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ABSTRACT

The roles of organizational slack, flexibility, and variety are considered with respect to the incidence of growth, stability, and decline in college and university enrollments and revenues from 1975 to 1979. Slack refers to the resources possessed by an organization beyond those needed for the most efficient possible level of operation. Flexibility focuses on the ability of an organization to redirect the use of resources in the short-run. Variety refers to the degree of institutional diversity; in this case, the diversity in an institution's programs and revenue sources.

The study was conducted using HEGIS data for 2,713 colleges and universities. These institutions were divided into groups according to whether their enrollments and revenues had grown, remained stable, or declined from 1975 to 1979. Differences among these groups on nine variables representing levels of slack, flexibility, and variety in 1975-76 were examined using multivariate analysis of variance. Public and private institutions were examined separately.

The results indicated that the constructs were useful in distinguishing between the incidence of growth, stability, and decline in enrollments and revenues in later years. Stable institutions exhibited higher levels of variety in programs and revenue sources than did stable or declining institutions. Institutions with declining enrollments had lower levels of slack resources than did growing or stable institutions. Conversely, institutions with declining revenues had higher levels of slack resources than did growing or stable institutions. Few differences were found between public and private institutions, and no readily interpretable patterns in the results was evident for flexibility.

These three constructs were then examined for institutions with declining enrollments and/or revenues with regard to variations in the severity of decline encountered. The results of the multivariate analysis of variance for private institutions showed that the level of slack resources decreased as the severity of enrollment and revenue decline encountered in later years increased. Similarly, the level of programmatic and revenue source variety decreased as the severity of enrollment and revenue decline encountered increased. As was the case in the preceeding analyses, no readily interpretable results were obtained for the flexibility variables. The multivariate analysis of variance for public institutions was not significant, although the pattern of the means for the slack and variety variables was similar to that for private institutions.

The discussion examines these results within the context of the population ecology and innovation literatures from the organization sciences. Directions for future research are also considered.

ORGANIZATIONAL CORRELATES OF DECLINE: SOME PRELIMINARY ANALYSES

The literature on decline and retrenchment in higher education has grown significantly over the past decade. Unfortunately, relatively little empirical research has been conducted in this area. Empirical research that examines the relationships between enrollment and revenue decline and organizational characteristics is needed if progress is to be made in understanding the nature of appropriate strategies for retrenchment. This paper takes a step toward that goal by examining the relationships among three organizational characteristics related to adaptability--slack, flexibility, and variety--and variations in the incidence and severity of enrollment and revenue decline in American colleges and universities.

The few empirical studies that have been conducted illustrate why research is needed on organizational processes under conditions of decline. Rubin (1977), for example, has shown that there is movement from a unit to an organizational perspective in the allocation of resources in educational institutions as resources become scarcer. This contrasts with the observed behavior of units competing for resources under conditions of growth (Pfeffer and Salancik, 1974; Salancik and Pfeffer, 1974). The ratios of administrative to operating personnel has also been found to increase in educational systems under conditions of decline (Freeman and Hannan, 1975; Hannan and Freeman, 1978; Ford, 1980a). In contrast, the organization science literature shows that administrative ratios decrease with organizational growth (Pondy, 1967; Rushing, 1967; Indik, 1964).

Bowen and Glenny's (1980) case study of ten California campuses responses to decline indicated that centralization of decision making

occurred under conditions of decline. This finding is consistent with research that shows that centralization increases rapidly with the onset of a crisis (Ford, 1980b; Hermann, 1963; Starbuck, Greve, and Hedberg, 1978). In contrast, decentralization typically occurs in growing organizations faced with increased environmental complexity (Mintzberg, 1979), which is the same environmental condition often observed in decline situations. Similarly, a number of authors report that there is a preference for strong, directive leadership in organizations when they are faced with decline or crisis (Cyert, 1978; Hamblin, 1958), even in situations where more participative styles of leadership would be more readily accepted under conditions of growth (Lowin, 1968; Bass, 1981). Decline also heightens the level of conflict within an organization (Cyert, 1978; Iannaccone, 1979; Boyd, 1979), while at the same time reducing the slack resources available to produce the "win-win" resolutions that are commonly employed under conditions of growth (Levine, 1978; Whetten, 1980a).

In essence, this research shows that organizational processes exhibit different dynamics under conditions of growth and conditions of decline. As a result, administrative strategies that are effective for coping with the problems created by growth are likely to be inappropriate in organizations faced with decline. Since relatively little is known about the management of decline (Whetten, 1980b) and administrators are generally trained to cope with the problems of growth and not of decline (Easton, 1976; Boulding, 1975), the need for a better understanding of the phenomenon and of the associated organizational dynamics is pressing. This research takes a first step toward increasing our understanding of the relationships between three

organizational characteristics that are associated with adaptability in the organization science literature--organizational slack, flexibility, and variety--and the incidence and severity of declining enrollments and revenues in American colleges and universities.

Slack, Flexibility, and Variety

Organizational slack refers to the resources possessed by an organization beyond those required for the most efficient possible level of operation. It is the pool of potential excess resources that can be called upon to buffer an organization from the impact of environmental change and uncertainty (Cyert and March, 1963; Thompson, 1967). In business organizations, slack can take the form of dividends paid to shareholders beyond those necessary to ensure their participation with the firm, excess production capacity, wages paid above the going rate, an unused line of credit, and so on (Katz and Kahn, 1978). In colleges and universities, slack can take the form of unrestricted funds, a pool of qualified applicants larger than the number of students admitted, a low student/faculty ratio, and so on.

Each form of slack resources provides a buffer for an organization against environmental uncertainty and turbulence by reducing its short-term dependence on the environment for resources. These excess resources increase an organization's ability to respond to conflicting demands (Pfeffer and Salancik, 1978), environmental change (Galbraith, 1973), and the need to innovate (Zaltman, Duncan, and Holbek, 1973). In general, slack enables an organization to respond to changing environmental conditions by providing the resource cushion necessary for modifying performance to fit new environmental conditions.

The concept of flexibility, as it is used here, is related to organizational slack in that it refers to one dimension of an organization's resourcefulness. While slack focuses on the level of resources within an organization, flexibility refers to the ability of the organization to redirect those resources in the short-run. Flexibility in the use of resources appears to be assumed in most discussions of organizational slack (see for example Katz and Kahn, 1978; Pfeffer and Salancik, 1978; Galbraith, 1973). The two, however, can be distinguished on logical grounds. An organization, for example, may pay higher than the going wage rate but it may not have short-term flexibility in the use of those resources because of a collective bargaining agreement. Other forms of flexibility are reflected in the degree to which revenues are uncommitted, the proportion of faculty that is untenured, and so on. All effect the ability of an educational institution to change direction under turbulent environmental conditions. Thus, flexibility refers to the degree that an organization is free to redirect its actions within the context of its existing resource base.

The third conceptual variable is that of variety (Ashby, 1956), which formally refers to the number of distinct elements within a system. The importance of the concept, with respect to organizational adaptation, is that under conditions of environmental change high variety organizations tend to out perform their low-variety counterparts. This is because their differentiated internal structure enables them to better respond to shifts in the environment (Hannan and Freeman, 1977; Zammuto, 1982a). As Miles (1980: 250) noted,"In order to cope with uncertainty emanating from the external environment, the

organization must create parts that match the attributes of environmental sectors, especially those that pose critical constraints and contingencies for the organization." In terms of colleges and universities, two important sources of variety are those of their program offerings and revenue sources.

Variety in the fields of study offered by an institution is particularly important when there are shifts in the demand for fields of study on the part of potential students. Liberal arts institutions, for example, have a relatively low degree of programmatic variety as compared to major doctoral universities. When the demand for educational programs shifted away from the humanities, social sciences, and education in the 1970's to the applied physical sciences, health sciences, and business (NCES, 1980: 131), liberal arts institutions generally had a more difficult time adjusting than did major doctoral institutions. The programmatic variety of the major doctoral institutions better matched that of the environment, making it possible for them to shift program emphases as the demand for services changed. Many liberal arts colleges, on the other hand, found the market for their traditional services eroding with no ready program replacements to match changes in demand.

Variety in an institution's revenue sources is also an important factor. The greater the degree to which an institution's sources of revenues are diversified (that is, acquired from tuition and fees, government appropriations, grants, gifts, contracts, and endowment income), the less vulnerable it is to environmental change. Private colleges, for example, may be more susceptible to the impact of declining enrollments because they are more dependent on tuition and

fees for revenues than are their public counterparts. The greater diversity in public institutions' sources of income may buffer them from fiscal stress caused by declining enrollments to some degree. In short, the variety exhibited by an institution on a number of dimensions is expected to be positively related to an institution's ability to adjust to environmental change.

The general expectation for the relationships between slack, flexibility, and variety and the incidence and severity of enrollment and revenue decline are as follows: institutions experiencing decline are likely to have significantly lower levels of slack resources, flexibility in the use of those resources, and lower levels of variety in their programs and revenue sources than organizations that subsequently do not experience decline. It is also expected that the severity of enrollment and revenue decline experienced by colleges and universities will be inversely related to the levels of institutional slack, flexibility, and variety. That is, the smaller the pool of slack resources, the less flexibility available in the use of those resources, and the lower the level of programmatic and financial variety, the more severe the enrollment and/or revenue decline an institution will experience.

METHODOLOGY

Data Base and Sample

Data for this study were drawn from the Higher Education General Information Survey (HEGIS) opening fall enrollment and finance questionnaires for the years 1975-76 through 1978-79, and from the institutional characteristics, employee, and earned degrees questionnaires for the 1975-76 academic year. Only institutions that

had complete data for all the items used in this study were included in the sample. This procedure resulted in 2,713 institutions being included in the sample.

Variables

Nine variables were constructed to represent different aspects of organizational slack, flexibility, and variety using the 1975-76 HEGIS data. The variables are presented in Table 1 and the formulas for calculating each are included in the methodological appendix. The reserve strength, expenditures per student, and student/faculty ratios were used as indicators of organizational slack. The reserve strength measure was designed particularly for private institutions and constructed to present a rough approximation of slack in the form of quasi-endowments. Gilmartin (1981) found that this measure distinguished between private four-year institutions that were in distress and those that were not.

Since this type of measure is inappropriate for public institutions, an expenditures per student variable was also constructed. Public institutions are more likely to make expenditures with excess funds since they cannot retain them in the form of quasi-endowments. Institutions that have greater expenditures per student as compared to similar institutions are likely to have more slack resources built into their cost structure. The total educational and general expenditure figure for each institution was adjusted using the consumer price index on the basis of geographic region and SMSA size (Bureau of Labor Statistics, 1978) to control for regional cost variations. Scores were then calculated on the basis of institutional type and control. This procedure resulted in the calculation of

normalized scores for 32 distinct groups of institutions as defined by the NCHEMS taxonomy of postsecondary institutions (Makowski and Wulfsberg, 1981). The ratio of student full-time equivalents (FTE) to full-time faculty provides another rough efficiency measure. A comparatively low ratio would indicate that an institution has slack in its faculty component as compared to institutions with a higher ratio.

Three measures of flexibility were included to reflect different aspects of an institution's flexibility to make changes in its operations in the short-run. The unrestricted private, gifts, grants and contracts ratio was to reflect the resources available to an institution to meet unforeseen contingencies. The interest payment measure was intended to provide one indication of the degree to which an institution's expenditures were invested in fixed costs. The tenured faculty ratio was included to reflect the degree to which an institution could restructure its faculty in the short-run to meet changing environmental conditions.

The three measures of variety were designed to represent different aspects of variety in an institution's program offerings and revenue sources. The number of programs offered variable provides an indication of the degree to which an institution is internally differentiated in terms of educational offerings. The dispersion of earned degrees across fields of study variable provides an indication of the diversity of program offerings across different areas as well as an indication of the institution's relative investment in different fields of study. The dispersion of revenue sources measure indicates the degree to which an institution is reliant on a few or many revenue sources.

Four categorical variables were also included in the analyses. Two of the variables represented an institution's enrollment and revenue experience over the period 1976-79 in terms of whether they were growing, stable, or declining. Institutions that experienced growing enrollments were defined as those having greater than five percent increase in student FTE's from 1975-76 to 1978-79. Stable enrollments were defined as those varying between plus or minus five percent of the 1975-76 FTE figure in 1978-79. Declining enrollments were defined as those that decreased more than five percent between 1975-76 and 1978-79. The distribution of institutions across the groups was as follows: 684 private and 478 public institutions experienced growing enrollments during the period of the study; 436 private and 421 public institutions were in the stable enrollments category; 414 private and 532 public institutions were in the decline category.

Changes in revenues, adjusted for inflation using the Higher Education Price Index (Halstead, 1980), were classified using the same criteria. The distribution of institutions across the groups was as follows: 880 private and 788 public institutions had growing revenues; 365 private and 380 public institutions experienced stable revenues; and 289 private and 263 public institutions had declining revenues.

Institutions that experienced a greater than five percent decrease in enrollments and/or revenues during the period under study were also classified as to the pattern of decline they experienced. The algorithm for classification by pattern of decline is contained in Zammuto (1982b). Three patterns were formulated--gradual, saw-toothed, and rapid--that captured similarities in both the year-to-year changes

institutions experienced and the severity of the decline encountered over the four year period. Classification into a fourth category, non-declining revenues or enrollments, was also possible if an institution had declining enrollments and stable or growing revenues or vice versa. One hundred and twenty-eight private institutions and 216 public institutions experienced gradual enrollment decline; 155 private and 185 public institutions encountered saw-toothed decline, and 131 private and 131 public institutions experienced rapid enrollment decline. Similarly, 106 private and 121 public institutions experienced gradual revenue decline; 103 private and 100 public institutions encountered saw-toothed revenue decline; and 80 private and 42 public institutions experienced rapidly declining revenues. The average severity of declining enrollments for each pattern was as follows: gradual (11.79% decrease in enrollments), saw-toothed (17.64% decrease), and rapid (29.69% decrease). Similarly, the average severity of declining revenues for each pattern was gradual (9.54% decrease in revenues), saw-toothed (17.61% decrease), and rapid (29.03% decrease).

Analyses

Multivariate analysis of variance was employed to determine whether there were associations between growth, stability, and decline in enrollments and revenues during 1976-79 and the levels of organizational slack, flexibility, and variety that each group of institutions exhibited 1975-76. The F ratio for the multivariate analysis of variance provides an indication of whether the mean differences simultaneously differentiate between institutions experiencing growth, stability, and decline in enrollments and/or

revenues in subsequent years. Examination of the univariate analyses are useful in gaining an understanding of which variables contribute significantly in describing the similarities and dissimilarities among institutions. Examination of the group means reveal what differences existed between institutions on each of the variables. Separate multivariate analyses of variance were conducted for public and private institutions for the purpose of examining differences on the basis of institutional control. Thus, the multivariate analyses of variance will show whether the conceptual variables of organizational slack, flexibility, and variety are useful in describing and gaining an understanding of the differences between growing, stable, and declining institutions.

Colleges and universities that experienced declining enrollments and/or revenues were further analyzed using multivariate analysis of variance to determine whether slack, flexibility, and variety were useful concepts for understanding why the severity of enrollment and revenue decline varied across institutions. The interpretation of this analysis parallels the one described above.

Results

Growth, stability, decline. The results of the analyses of variance for each variable and for the multivariate analyses of variance are presented in Table 2. For public institutions, the multivariate F's were significant for both revenues ($p \leq .001$) and enrollments ($p \leq .001$). No significant interaction between revenues and enrollments was found. Significant revenue differences were found for six of the nine variables. Examination of the mean differences for these items showed that institutions with declining revenues had a

larger student-faculty ratio and expenditures per student than did public institutions with stable or growing revenues. Declining and stable institutions also had proportionately more tenured faculty than did growing institutions. Stable institutions had a greater number of programs, more dispersion of degrees across fields of study, and more diverse revenue sources than did either the growing or declining institutions.

Significant enrollment differences were found for five of the nine items. Public institutions with declining enrollments had a higher student-faculty ratio and a lower level of expenditures per student than did schools with growing or stable enrollments. As in the case of revenues, declining and stable schools had proportionately more tenured faculty than did growing schools. Stable schools also had a greater number of programs, more dispersion of degrees across fields of study, and more dispersion in their revenue sources than did declining or growing institutions.

Two significant interactions were found between enrollments and revenues in the univariate analyses. Examination of the cell means for number of programs indicated that public institutions with stable revenues and enrollments had a much higher average number of programs than did schools in any of the other categories. Examination of the cell means for the dispersion of degrees variable indicated that institutions with stable or growing enrollments and stable or growing revenues had a much higher level of dispersion across fields of study than institutions in the remaining cells.

The findings for private institutions were similar to those for public institutions. The multivariate F's were significant for both

revenues ($p \leq .001$) and enrollments ($p \leq .001$). A significant interaction was found between revenues and enrollments ($p \leq .05$). Significant revenue differences were found for six of the nine variables. Examination of the group means showed that private institutions with declining revenues had, on the average, higher expenditures per student and proportionately more unrestricted gifts, grants, and contracts than did schools with stable or growing revenues. Stable institutions had the highest proportion of tenured faculty and higher levels of variety as measured by number of programs, dispersion of degrees across fields of study, and dispersion of revenue sources. Declining institutions had fewer programs than did stable or growing institutions and a dispersion of degrees and revenue sources similar to that of growing institutions.

Significant differences on the basis of enrollments were also found for these six variables. With the exception of expenditures per student, the pattern of mean differences was the same as that for revenues. In the case of expenditures per student, declining schools had a lower level of expenditures as compared to stable and growing institutions. Significant interactions were observed for reserve strength, expenditures per student, and the ratio of unrestricted private gifts, grants, and contracts. Examination of the cell means for these variables showed that: 1) private institutions that experienced both enrollment and revenue decline had the lowest levels of financial reserves at the beginning of the period, 2) expenditures per student were much higher for institutions with growing revenues and declining enrollments, and much lower for institutions with declining revenues and growing enrollments, than for institutions with other

enrollment and revenue experiences, and 3) the proportion of unrestricted private gifts, grants, and contracts was much lower for institutions with stable enrollments and growing or stable revenues than it was for other institutions.

Patterns of decline. The results of the univariate and the multivariate analyses of variance are presented in Table 3. For public institutions, the multivariate F's were not significant for revenues, enrollments, or their interaction. This indicated that the nine variables in combination did not significantly discriminate between institutions experiencing different patterns of decline. While the multivariate tests were not significant, the univariate analyses revealed significant revenue differences for three of the nine items. Examination of the group means for these items indicated that institutions experiencing saw-toothed and rapid decline, which were the more severe patterns, had higher student-faculty ratios than did institutions encountering gradual revenue decline or declining enrollments and growing revenues. There also appeared to be an inverse relationship between the severity of decline and expenditures per student. That is, the more severe the revenue decline encountered during 1976-79, the less the institution expended per student in 1975-76. The exception to this was institutions that had stable or increasing revenues and declining enrollments. These institutions had a rate of expenditures comparable to that of institutions experiencing rapid revenue decline. Significant differences for the proportion of tenured faculty were also found, but there was no obvious pattern to the group means.

Significant enrollment differences were also observed for three of the nine variables. The results show that there is an inverse relationship between expenditures per student and the severity of enrollment decline encountered. Institutions with rapidly declining enrollments had the lowest expenditures per student while institutions with stable or growing enrollments and declining revenues had the highest expenditures per student. Significant differences in the proportion of tenured faculty were also observed, but as was the case for revenues, there were no obvious patterns to the mean differences. The results also indicated that institutions experiencing the more severe forms of enrollment decline--the saw-toothed and rapid patterns--tended to have fewer programs than did the institutions experiencing gradual decline.

For private institutions, the multivariate F's were significant for both revenues ($p \leq .05$) and for enrollments ($p \leq .001$). No significant interaction between revenues and enrollments occurred. Significant revenue differences were found for three of the nine variables. Examination of the group means showed that institutions experiencing rapid revenue decline had a much higher student-faculty ratio than did institutions encountering the gradual or saw-toothed patterns. The data also indicated that institutions encountering saw-toothed decline had the highest expenditures per student with the gradual and rapidly declining institutions having comparable levels of expenditures. Generally, institutions encountering the more severe forms of revenue decline had less dispersion of degrees across fields of study as compared to institutions encountering less severe declines.

Significant enrollment differences were found for six of the nine variables. Comparison of the group means indicated that the student-faculty ratio increased with the severity of enrollment decline encountered, and that expenditures per student decreased with the severity of decline. Schools encountering saw-toothed and rapid decline tended to have a lower proportion of tenured faculty as compared to the other institutions. Schools experiencing saw-toothed and rapid decline also had significantly lower levels of programmatic and revenue variety as measured by the number of programs offered, dispersion of degrees across fields of study, and dispersion of revenue sources.

DISCUSSION

It appears that variety is the major organizational characteristic associated with growth, stability, and decline in the revenues and enrollments of colleges and universities. Slack does appear to be related to the incidence of decline, but not as strongly as variety. Significant results were obtained for flexibility but the interpretation of these findings is unclear. Overall, the findings suggest that programmatic and financial variety are strongly associated with the incidence of enrollment and revenue decline in colleges and universities.

In terms of the severity of enrollment and revenue decline encountered, the results of the multivariate analyses of variance were significant for private, but not for public, institutions. In the case of private institutions, it appears clear that there is a strong association between slack and variety and the severity of enrollment and revenue decline encountered. As in the growth, stability, and

decline analyses, flexibility appeared to add little to understanding the dynamics of decline in colleges and universities. Overall, the findings concerning the construct of flexibility indicate either that it is not empirically distinguishable from that of organizational slack, or that the variables employed in this study did not adequately represent the concept. The remainder of the discussion focuses on potential explanations for the observed relationships between organizational variety and slack and the incidence and severity of decline in colleges and universities. While the analyses presented do not address issues of causality, the temporal sequencing of the variables is suggestive.

The findings concerning variety and the incidence and severity of decline are consistent with the specialist/generalist distinction made in the population ecology literature on organizations. The difference between specialist and generalist organizations is that specialists engage in a relatively narrow range of activities while generalists embrace a wider scope of operations (Aldrich, 1979). The scope or diversity of an organization's activities has a number of implications for the trade-offs between institutional efficiency and institutional adaptability under conditions of environmental change (Hannan and Freeman, 1977).

Specialists organizations perform more efficiently than do generalists. Concentration of activities in a relatively small number of specialized areas allows for economies of scale and reduces the amount of resources that need to be devoted to non-task areas. The findings on the relationships between the enrollment experiences of institutions, programmatic variety, and expenditures per student

conform to this expectation with one interesting modification. Generalist educational institutions--those with a relatively high degree of programmatic variety--tended to fall into the stable enrollment category. Specialist educational institutions, on the other hand, fell into either the enrollment growth or enrollment decline categories. The group means indicated that specialist schools in the declining enrollments category had lower expenditures per student as compared to that of the generalist schools that experienced enrollment stability (i.e., the declining specialists were more efficient). In contrast, specialists in the growing enrollments category had comparable or higher levels of slack resources as compared to the stable generalists. This suggests that there is a relationship between organizational slack and variety in that specialist organizations appear to accumulate slack at a faster pace than generalists under conditions of growth and consume them more quickly under conditions of decline.

While less efficient than the specialists, the internal diversity of the generalists allows them to perform better under changing environmental conditions. The diversity of activities provides generalist organizations with more options when faced with environmental change. As was noted earlier, there was a shift in the demand for fields of study during the 1970's. Enrollments in the social sciences, humanities, and education declined while they increased in the fields of the applied physical sciences, health sciences, and business. Generalist institutions, such as major doctoral and comprehensive universities, had the ability to shift programmatic emphases as the demand for fields of study changed.

Specialist institutions, such as divinity and liberal arts schools, did not have this option open to them. Thus a high degree of specialization makes an organization increasingly susceptible to decline as the demand for its specialized activities decrease.

The inverse of this relationship also appears to hold. While specialist organizations are more susceptible to decline than generalist institutions, they are also more likely to experience rapid growth. The enrollments in some of the areas of the generalist will decline while others increase. Variation in the demand for different fields of study creates overall stability for the generalist organization. The specialist organization, on the other hand, is more likely to experience either growth or decline, and not stability. As the demand for its field of study increases, the organization will grow. As demand decreases, the institution's enrollments will decline. Overall, it can be expected that the enrollments of specialized institutions will be more volatile than those of generalist educational organizations. Generalist organizations are more prone to stability than specialists, and perform better than specialists when there are shifting demands for services (Hannan and Freeman, 1977).

Similarly, the findings indicate that a high dispersion of revenue sources has the same effect in buffering an institution from financial instability. Institutions with a high dispersion of revenue sources tended toward revenue stability, while lower variety institutions were more prone to either revenue growth or decline.

A similar interpretation can be drawn concerning the relationship of variety and the severity of decline encountered. The data suggest that generalist organizations that experience decline tend to encounter

less severe forms of decline, while specialists appeared to be more likely to experience saw-toothed or rapid decline. One interpretation of this finding is that generalists are less prone to rapid downward shifts or large year-to-year fluctuations in enrollments because of their relatively high programmatic diversity. The stabilizing effects of diversity, as discussed above, seems to buffer generalist institutions from the most severe forms of decline.

The findings concerning slack and the severity of decline for private institutions suggest that the presence of sufficient slack resources can mediate the effects of decline. This is predicated in the notion that organizations encountering enrollment and revenue decline generally have to do something differently as opposed to waiting for the environmental conditions that caused decline to improve. The literature on innovations provides some guidance in understanding why slack may mediate the impact of decline.

Knight (1967) and Zaltman et al (1973) note that there are different forms of innovation. The two of concern here are slack innovation and distress innovation. These authors suggest that when organizations have slack resources, innovation often involves an external search for new products, services, and technologies with a comparatively low level of change in the organization's structure or personnel. Slack provides the resources necessary for the external search and implementation of an innovation. Distress innovation usually occurs when an organization encounters a situation that jeapordizes its existence. Wide and random searchs for radical organizational changes take place. Usually this results in major changes in organizational structure and personnel, and moderate to

little change in the organization's products, services, and technologies. Part of the reason this occurs is that the organization has relatively little time to innovate, and there are few slack resources to be used for external search or implementation. Thus, slack innovation is more likely to result in changes in the products, services, and technologies of an organization, while distress innovation is more likely to result in structural and personnel changes within the organization.

Assuming that one of the major factors causing enrollment decline in many colleges and universities during the period under study were changes in the demand for fields of study, the moderating effect of slack on declining revenues and enrollments becomes more understandable. It has to be kept in mind that it was institutions with relatively low levels of programmatic variety that encountered enrollment and revenue decline. Also, the organizations that encountered the most severe forms of decline tended to be characterized as having lower levels of programmatic variety and slack than the organizations experiencing the less severe forms of decline.

Within this context, it appears that organizations experiencing the more severe forms of decline are likely to be confronted with the need to innovate under conditions of distress. Given that these organizations have relatively specialized program offerings to begin with, and that the decline they are facing is partly a function of reduced demand for their programs, distress innovation leading to internal rearrangements of the institution are not likely to help it recover from decline. In fact, internal modifications taken to increase efficiency under these conditions can increase the severity of

decline (Bozeman and Slusher, 1979). The presence of slack resources appears to be a prerequisite for an institution to engage in the types of programmatic innovations that are required to survive in a changing environment. Internal readjustments in existing institutional arrangements may increase efficiency in the short-run but do nothing to resolve the longer-term problems an organization faces. Actions taken to increase organizational efficiency in situations that call for changes in what the organization is doing enhances the likelihood that the organization will not survive (Zammuto and Cameron, 1982). Slack resources may be a prerequisite for taking the "right" types of actions in countering the impact of revenue and enrollment decline. They also buffer the organization from the most severe effects of decline as it innovates.

Conclusion

The findings of this study are consistent with previous research in that they show that differences exist in organizational processes under conditions of growth, stability, and decline. One implication that can be drawn from the findings on organizational variety is that educational institutions that have a low degree of programmatic variety need to be highly sensitive to changes in their environment, more so than institutions with more diverse programmatic bases. The lack of ready programmatic alternatives to meet shifting demands for fields of study suggests that specialist educational institutions need as long as lead times as possible in developing strategies and programmatic alternatives to meet emerging demands.

A similar implication can be drawn from the findings on organizational slack. Efficient educational institutions also need to

be highly sensitive to environmental change than organizations with greater levels of slack resources. As in the case of specialist organizations above, efficient organizations need long lead times to engage in slack innovation. Otherwise, distress innovation becomes likely and the institution's future can become problematic.

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TABLE 1

MEASURES OF ORGANIZATIONAL SLACK,
FLEXIBILITY AND VARIETY

SLACK

1. Reserve Strength: ratio of current fund balance plus 20 percent of the endowment fund balance at the beginning of the fiscal year to total educational and general expenditures.

2. Expenditures per student: ratio of educational and general expenditures adjusted for region and metropolitan size to student full-time equivalents. Normalized scores (Z-scores) were calculated for groups by institutional type and control.

3. Ratio of student full-time equivalents (FTE) to full-time faculty.

FLEXIBILITY

4. Ratio of unrestricted private gifts, grants, and contracts to total current fund revenues.

5. Ratio of interest payments on plant indebtedness to total current fund expenditures.

6. Ratio of tenured full-time faculty to total full-time faculty.

VARIETY

7. Number of programs offered.

8. Dispersion of earned degrees across fields of study.

9. Dispersion of revenues across revenue sources.

TABLE 2

UNIVARIATE AND MULTIVARIATE ANALYSES OF VARIANCE ON SLACK, FLEXIBILITY AND VARIETY VARIABLES BY GROWTH, STABILITY AND DECLINE IN REVENUES AND ENROLLMENTS

F - Values

	Public			Private		
Univariate Tests	Revenue	FTE	Revenue xFTE	Revenue	FTE	Revenue xFTE
Reserve Strength	1.87	.07	1.38	2.20	1.91	3.03*
Student/Faculty Ratio	6.50**	5.84**	2.29	1.02	1.35	.39
Educational & General Expenditures/FTE	9.82***	27.71***	1.57	4.00*	13.96***	3.03*
Unrestricted Private Gifts, Grants & Contracts/ Total Revenues	.78	.89	.26	3.01*	10.17***	2.86*
Plant Interest/ Total Expenditures	2.87	1.39	.94	1.44	1.70	.92
Tenured Faculty/ Total Faculty	16.43***	8.55***	1.41	6.97***	15.54***	1.96
Number of Programs	9.65***	35.62***	2.57*	4.99**	27.94***	1.65
Dispersion of Degrees	7.49***	23.55***	2.37*	3.19*	26.24***	.55
Dispersion of Revenues	6.61**	1.42	.70	7.92***	14.12***	1.01
Multivariate Tests						
Hotellings T	6.64***	6.07***	1.41	3.14***	6.55***	1.57*

* $p \leq .05$
** $p \leq .01$
*** $p \leq .001$

Public: n = 1364
Private: n = 1349

TABLE 3

UNIVARIATE AND MULTIVARIATE ANALYSES OF VARIANCE ON SLACK, FLEXIBILITY, AND VARIETY VARIABLES BY PATTERNS OF DECLINE IN REVENUES AND ENROLLMENTS

F - Values

	Public			Private		
Univariate Tests	Revenue	FTE	Revenue xFTE	Revenue	FTE	Revenue xFTE
Reserve Strength	.58	.46	.64	1.14	.45	.23
Stud nt/Faculty Ratio	3.19*	2.30	.80	11.10***	6.47***	1.78
Educational & General Expenditures/FTE	11.78***	5.55***	1.02	6.58***	4.94***	1.00
Unrestricted Private Gifts, Grants & Contracts/ Total Revenues	1.12	.27	.09	1.20	1.14	.72
Plant Interest/ Total Expenditures	.96	2.24	1.54	.34	1.49	.26
Tenured Faculty/ Total Expenditures	3.15*	4.49**	1.00	2.61*	12.97***	.81
Number of Programs	.57	6.77***	1.96*	2.72*	7.97***	.58
Dispersion of Degrees	.89	.73	.52	6.10***	13.27***	1.16
Disperson of Revenues	1.16	.26	1.37	3.90**	7.46***	.75
Multivariate Tests						
Hotelling's T	1.46	1.09	.98	1.64*	2.79***	.90

* $p \leq .05$
** $p \leq .01$
*** $p \leq .001$

Public: n = 589
Private: n = 432

METHODOLOGICAL APPENDIX

1. Measures of Organizational Slack

   a) Reserve Strength

   $$\frac{\text{Current fund balance + 20\% of the endowment fund balance at the beginning of 1975-76}}{\text{Total Educational and General Expenditures}}$$

   b) Expenditures per Student

   $$\frac{\text{Total Educational and General Expenditures}}{\text{Full-time student equivalents (FTE)}}$$

   Where total E & G expenditures are adjusted for region and metropolitan size using the consumer price index (Bureau of Labor Statistics, 1978).

   Standardized scores were then calculated on the basis of institutional type (Makowski and Wulfsberg, 1981) and institutional control (public/private).

   c) Student/Faculty Ratio

   $$\frac{\text{Full-time student headcount + part-time student FTE}}{\text{Full-time faculty (9/10 or 11/12 month contracts)}}$$

2. Measures of Organizational Flexibility

   a) Ratio of unrestricted private gifts, grants, and contracts to total current fund revenues.

   b) Ratio of interest payments on plant indebtedness to total current fund expenditures.

   c) Ratio of tenured full-time faculty to total full-time faculty.

3. Measures of Programmatic and Financial Variety

a) Number of programs = count of HEGIS four-digit program codes.

b) Dispersion of degrees across fields of study

The following is the standard equation for measuring dispersion in categorical data:

$$\frac{-\sum_{i=1}^{n} p_i \log p_i}{1/n \log 1/n}$$

The denominator assumes that equal dispersion across the categories yields maximum variety. Both 3 (a) and 3 (b) are calculated using this general equation.

The four-year institutions, the variable was calculated for the dispersion of degrees across the following categories: 1) humanities, 2) physical and life sciences, 3) social sciences, 4) medical and health professions, 5) applied physical sciences, 6) business and management, 7) education, and 8) other professions.

For two-year schools, the following categories were employed: 1) arts and science, 2) data processing technologies, 3) health services and paramedical technologies, 4) mechanical and engineering technologies, 5) natural science technologies, 6) business and commerce technologies, and 7) public service related technologies.

c) Dispersion of revenue sources

For four-year institutions, the categories used in calculating dispersion were: 1) net tuition and fees (minus scholarships and fellowships), 2) government appropriations, 3) government grants and contracts, 4) gifts, 5) endowment income, and 7) other income.

Four two-year schools, the government appropriations category was divided into a) federal and state appropriations, and b) local appropriations. (Collier and Patrick, 1978).